

**MIXED NOBLE METAL/NOBLE
METAL OXIDE BOTTOM ELECTRODE FOR
ENHANCED PGO C-AXIS NUCLEATION AND GROWTH**

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ABSTRACT OF THE INVENTION

A method is provided for forming a single-phase c-axis PGO film overlying a Pt metal electrode. Although the method is summarized in the context of a Pt bottom electrode, it has a broader application to other noble metals. The method comprises: forming a bottom electrode mixture of Pt and Pt₃O₄; forming a single-phase c-axis PGO thin film overlying the bottom electrode; and, forming a top electrode overlying the PGO thin film. Forming a bottom electrode mixture of a Pt and Pt₃O₄ includes: forming a Pt first layer; and, forming a second layer, interposed between the first layer and the PGO thin film, of fully oxidized Pt₃O₄. In other aspects, forming a bottom electrode mixture of Pt and Pt₃O₄ includes forming a polycrystalline mixture of Pt and Pt₃O₄. A c-axis PGO film capacitor is also provided. Again, a Pt bottom electrode is described, along with other noble metal bottom electrodes.